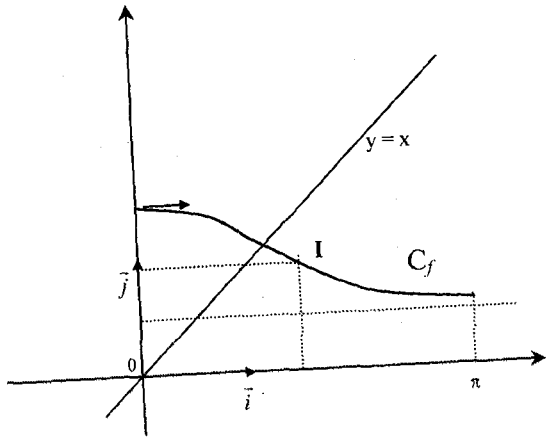
3°/



Solution 15 :

1°/ f est définie ,continue et dérivable sur $\mathbb{R}$ car $\forall x \in \mathbb{R}$, $x^2+1>0$

$$\forall x \in \mathbb{R}\ ,\ f'(x) = \frac{\sqrt{x^2+1} - \dfrac{x(x+1)}{\sqrt{x^2+1}}}{x^2+1} = \frac{1-x}{(x^2+1)^{3/2}}$$

x	$-\infty$		1		$+\infty$
$f'(x)$		$+$	0	$-$	
$f(x)$		↗	$\sqrt{2}-1$	↘	
	-2				0

- $\lim\limits_{x\to-\infty} f(x) = \lim\limits_{x\to-\infty} \dfrac{x\left(1+\frac{1}{x}\right)}{|x|\sqrt{1+\frac{1}{x^2}}} - 1 = \lim\limits_{x\to-\infty} \dfrac{1+\frac{1}{x}}{-\sqrt{1+\frac{1}{x^2}}} - 1 = -2$

- $\lim\limits_{x\to+\infty} f(x) = \lim\limits_{x\to-\infty} \dfrac{1+\frac{1}{x}}{-\sqrt{1+\frac{1}{x^2}}} - 1 = 0$

2°/

a) $T : y = f'(0)x + f(0) \Rightarrow y = x$